

Appl. No. 10/626,556
Amdt. dated September 1, 2005
Reply to Office action of June 1, 2005

REMARKS/ARGUMENTS

Claim Amendments

Claims 1-51 have been canceled.

5 New claims 52-63 have been submitted.

10 Claim 52 is directed toward an erosion-resistant fluid-handling part comprising: a fluid-handling part; a coating composition disposed on the fluid-handling part at a dry film thickness greater than about 200 μm and wherein the coating composition comprises: a trifunctional silane ranging from about 0.01% by weight to about 20% by weight of the
15 coating composition; a silanol fluid having a weight average molecular weight of at least 4000 g/mol wherein the silanol fluid ranges from about 40% by weight to about 99% by weight of the coating composition; and fumed silica ranging from about 0.01% by weight to about 25% by weight of the coating composition. Support for this claim is found in paragraphs [0032] and [0064].

Claim 53 specifies the dry film thickness ranging from about 200 μm to about 3000 μm . Support for this claim is found in paragraph [0064].

20 Claim 54 specifies that the silanol fluid has a weight average molecular weight ranging from about 4000 g/mol to about 150,000 g/mol. Support for this claim is found in paragraph [0027].

25 Claim 55 is dependent on claim 52 and is directed toward the coated fluid-handling part having a particle-impact erosion rate less than about 13% of the particle-impact erosion rate of uncoated 1100 aluminum. Support for this claim is found in paragraph [0083].

Claim 56 is dependent on claim 52 and includes a primer composition disposed on the fluid handling part. Support for this claim is found in paragraph [0057].

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Claim 57 is dependent on claim 56 and defines the primer composition as an epoxy primer composition comprising an epoxy blend, an aliphatic amine, and a silane adhesion promoter. Support for this claim is found in paragraph [0057].

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Claim 58 is dependent on claim 57 and defines the silane adhesion promoter as selected from the group consisting of: a trimethoxysilane, a triethoxysilane, and 3-glycidoxypentyl trimethoxysilane. Support for this claim is found in paragraph [0057].

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Claim 59 is dependent on claim 52 and defines the fluid handling part. Support for this claim is found in paragraphs [0070], [0071], [0072], [0073], and [0074].

Claim 60 is dependent on claim 59, and defines the fluid-handling part as a hydroelectric turbine. Support for this claim is found in paragraph [0076].

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Claim 61 is dependent on claim 52 and directed toward the fluid-handling part having a first erosion-resistant coating disposed thereon and wherein a second erosion-resistant coating is disposed on the first erosion-resistant coating. Support for this claim is found in paragraph [0066].

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Claim 62 is directed toward an erosion-resistant fluid-handling part comprising: a hydroelectric turbine; an epoxy primer composition disposed on the hydroelectric turbine, the epoxy primer composition comprising an epoxy blend, an aliphatic amine, and a silane adhesion promoter; a coating composition disposed on the epoxy primer composition at a dry film thickness ranging from about 200 μm to about 3000 μm , wherein the coating composition comprises: a trifunctional silane ranging from about 0.01% by weight to about 20% by weight of the coating composition; a silanol fluid having a weight average molecular weight ranging from about 4000g/mol to about 150,000 g/mol and wherein the silanol fluid ranges from about 40% by weight to about

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99% by weight of the coating composition; and fumed silica ranging from about 0.01% by weight to about 25% by weight of the coating composition. Support for this claim is found in paragraphs [0076], [0057], [0032], and [0064].

5 Claim 63 is directed toward a coated hydroelectric turbine having a particle-impact erosion rate less than about 13% of the particle-impact erosion rate of uncoated 1100 aluminum. Support for this claim is found in paragraphs [0076] and [0083].

10 Double Patenting

Claims 43-47 stand as provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 57-61 of copending Application No. 10/429238. The Examiner asserts that "although the conflicting claims are not identical, they are not patentably distinct from each other because the coating compositions overlap and are applied to the same type of parts."

15 Application No. 10/429238 has been Expressly Abandoned under 37 CFR 1.138 as of August 30, 2005. Therefore, the rejection is without basis and should be withdrawn.

20 Claim Rejections – 35 USC §102

Claims 43-47 stand as rejected under 35 USC §102(e) as being anticipated by 10/429238. The Examiner asserts that the compositions of '238 and [the instant application] '556 overlap, and are both used to coat parts such as turbines." The applied reference has a common inventor with the instant application. The Examiner is referred to the attached Declarations under 37 CFR 1.132 establishing that Karl E. Wiedemann and Rajagopalan Sivakumar are the inventors of the disclosed subject matter and, therefore, the invention is not by "another." Hence, the rejection is without basis and should be withdrawn.

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Claim 43 stands as rejected under 35 USC §102(b) as being anticipated by EP1046689. The Examiner asserts that "'689 teaches the application of an abrasion resistant, high hardness coating for glass such as aircraft cockpit windows, which may be considered a fluid-handling part, as the window would be subject to rain (see Abstract).
5 The composition comprises a polysiloxane with terminal reactive groups, that may be hydroxyl, tri functional silanes such as ethyltriacetoxysilane and silica (see pages 3-6 of translation)."

Claim 43 has been canceled and new claim 52 is presented. Claim 52 is directed toward an erosion-resistant fluid-handling part comprising: a fluid-handling part; a
10 coating composition disposed on the fluid-handling part at a dry film thickness greater than about 200 μm , wherein the coating composition comprises: a trifunctional silane ranging from about 0.01% by weight to about 20% by weight of the coating composition; a silanol fluid having a weight average molecular weight of at least 4000 g/mol and wherein the silanol fluid ranges from about 40% by weight to about 99% by weight of the
15 coating composition; and fumed silica ranging from about 0.01% by weight to about 25% by weight of the coating composition. Support for this claim is found in paragraphs [0032] and [0064]. The '689 application describes "a transparent, non wettable coating compound, including (a) a polydialkoxysiloxane, (b) a polysiloxane with reactive terminal groups, (c) a reticulating agent, (d) colloidal silica, and (e) a hardening catalyst."
20 (See page 4 of the translation.) Applicants' invention can be distinguished from the '689 application in several ways. In particular, the '689 application discloses that the compound is applied to substrates "in a thickness of several micrometers to several tenths of micrometers." (See page 7 of the translation.) Applicants' claimed invention is directed towards a fluid-handling part having a dry film thickness greater than about
25 200 μm . (Claim 52) Next, the '689 application discloses the use of colloidal silica in its formulation. Applicants' claimed formulation employs fumed silica. Lastly, applicants' claimed proportions of the individual components of the coating composition are not disclosed in the '689 application. Therefore, the rejection is without basis and should be withdrawn.

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Claims 43 and 45 stand as rejected under 35 USC §102(b) as being anticipated by WO 98/38391. The Examiner asserts that "'391 teaches applying a composition to steel (5:14) or other materials that are subjected to an aquatic or marine environment (1:6-27; 5:33-6:6). The composition comprises a hydroxyl-group containing siloxane (see pages 7-22), a trifunctional silane as shown on page 9, and a filler such as silica (24:30-36). Also see examples."

Applicants respectfully disagree. Claims 43 and 45 have been canceled. New claim 52 is presented. The '391 application fails to disclose an erosion-resistant fluid-handling part comprising a fluid-handling part having the coating composition claimed in claim 52. In particular, '391 fails to disclose the fluid-handling part with the coating at a dry film thickness greater than about 200 μm . Rather, the coating thickness is described as being less than 200 μm . (See page 27, lines 1-5.) In addition, the '391 application fails to disclose a silanol fluid having a weight average molecular weight of at least 4000 g/mol. Rather, the silanol fluids disclosed are of much lower molecular weights as indicated by the viscosity. Therefore, applicants' claimed invention is distinguished from that of the '391 application and the rejection should be withdrawn.

Claim Rejections – 35 USC §103(a)

Claims 44 and 46 stand as rejected under 35 USC §103(a) as being unpatentable over WO 98/39391. The Examiner asserts that "'391 is applied for the reasons given above and that '391 does not teach that the composition is applied to a hydroelectric turbine. '391 teaches that the composition is used in a marine or aquatic environment. It would have been obvious to one of ordinary skill in the art to have used a known antifouling composition as described by '391 on a hydroelectric turbine for its known antifouling properties."

Applicants respectfully disagree. The invention is directed toward an erosion-resistant fluid-handling part. "The coating formed from the composition is useful in protecting the fluid-handling part from degradation by the surrounding environment. For

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example, the coating protects the fluid-handling part from erosion caused by particle impact, impingement, or cavitation. Erosion by particle impact is caused by particles entrained in the moving fluid, which can be either a gas or a liquid. Impingement is an accelerated form of corrosion associated with bubbles entrained in the moving fluid.

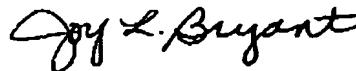
5 Cavitation occurs in incompressible fluids, such as water; cavitation involves the sudden collapse of bubbles which have been produced by the boiling of the fluid at a low pressure." (See paragraph [0023].) "In this application for patent, the term "erosion-resistant" is used to refer to resistance to erosion induced by impacting particles, impingement, and cavitation." (See paragraph [0024].) Applicants' invention is not
10 directed toward antifouling. In particular, applicants mention the disadvantage to using flexible silicone polymer coatings because such coatings cannot withstand severe mechanical stresses. (See paragraph [0012].) The coatings described in '391 are made with a lower molecular weight silanol, have cured thicknesses less than 200 μm , and are not suitable for erosion-resistance due to impacting particles, impingement, and
15 cavitation. Therefore, it would not have been obvious of one of ordinary skill in the art to arrive at the instant invention based on the teaching in the '391 application and the rejection should be withdrawn.

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CONCLUSION

In view of the above Amendments and Remarks, it is submitted that claims 52-63 are in condition for allowance. Reconsideration and withdrawal of the objections and
5 rejections are requested and allowance of the claims at an early date is solicited.

Respectfully submitted,



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